

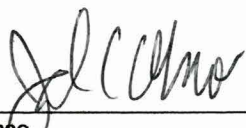
**Chevron Phillips Chemical Puerto Rico  
Core, Inc.**

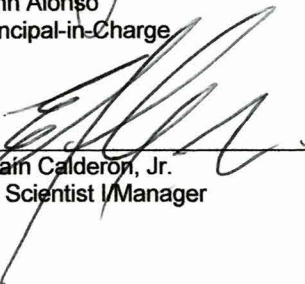
**Groundwater Results**

Post-Closure of Old and New Ballast Water Basins –  
January 2007

February 6, 2007



  
\_\_\_\_\_  
John Alonso  
Principal-in-Charge

  
\_\_\_\_\_  
Efraim Calderon, Jr.  
Sr. Scientist / Manager

## **Groundwater Results**

### **Sampling of Five Monitoring Wells**

Prepared for:  
Chevron Phillips Chemicals PR Core, Inc.

Prepared by:  
BBL Caribe Engineering P.S.C.  
Edificio La Electronica  
Calle Bori 1608  
Oficina 303  
Rio Piedras  
Puerto Rico 00927  
Tel 787 777 4000  
Fax 787 777 8086

Our Ref.:  
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Date:  
February 6, 2007

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## Transmittal Letter

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 Mr. Néstor Márquez, PE  
 Chevron Phillips Chemical PR Core, Inc.  
 Guayama, Puerto Rico

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 Mr. Efraín Calderón

Date:  
 February 7, 2007

Subject:  
 Groundwater Results

ARCADIS Puerto Rico Project No.:  
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Table 1	Summary of Monitoring Well ID, Total Depth, Water Level and Date Sampled Information, January 2007
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**Appendices**

A	Water Sampling Logs
B	Field Calibration Logs
C	Laboratory Analytical Results
D	Chain-of-Custody



## 1. Introduction

BBL Caribe Engineering, P.S.C. (BBL) was retained by Chevron Phillips Chemicals Puerto Rico Core, Inc. (CPCPRC) to conduct Annual groundwater sampling of five monitoring wells, (MW-137, MW-138, MW-149, MW-150 and MW-151) as part of the Closure for the Old and New Ballast Water Basins located at the CPCPRC facility in Guayama, Puerto Rico. The wells are part of a groundwater monitoring system installed on and around the former Ballast Basins.

This report describes the groundwater sampling procedures, presents the field measurements and laboratory analytical results obtained during the January 2007 sampling event conducted by BBL.

During the Annual monitoring event, prior to sampling, field measurements were taken, and recorded in field data forms (**Appendix B**). All well samples, were analyzed for, benzene, ethyl-benzene, toluene, xylenes (BTEX), naphthalene and lead. Laboratory analyses were conducted by PACE Laboratory, which also provided the sample containers. PACE Laboratory is contracted directly by CPCPRC.

### 1.1 Monitoring Procedures

BBL's personnel performed the sampling event during the month of January 2007.

Static water levels and product thickness were measured in monitoring wells with an ORS oil/water interface probe. This instrument employs two-wire electrodes, and is marked every 0.01 feet (ft).

The wells sampled are listed in **Table 1**. Wells were analyzed for, BTEX, naphthalene and lead. To ensure that well samples were representative of the formation, 3 to 4 well casing volumes were purged from each well before sampling.

A low flow peristaltic purging/sampling pump was used to sample wells. The tubing used was a combination of Tygon and Teflon 3/16 ID. Tubing was replaced after each well to avoid cross contamination. The pump intake was placed approximately 1 foot below the water table. In wells that had a screen length that was entirely submerged, the pump intake was placed approximately 1 foot below the top of the screen.



During well purging, field measurements for pH, Redox Potential, and Temperature (°C) were measured with a Cole-Parmer R 59002-02 meter, Dissolved Oxygen (mg/L – milligrams per liter) was measured with an YSI Model 55 oxygen meter; and Specific Conductivity (µmhos/cm, millisiemens/cm) was measured with a Cole-Parmer conductivity meter Model 19815-00. Measurements were taken at approximately every ¼ well volume. Field measurements for each well are shown in **Appendix A**. Groundwater samples were collected in laboratory-supplied containers; labeled and stored in coolers with ice in double-zip locked bags. The samples were relinquished to FEDEX at the end of each sampling day. Chain-of-Custody Forms were filled out every sampling day. Copies of Chain-of-Custody Forms are included in **Appendix D**.

### 1.2 Field Measurements

A low flow peristaltic purging/sampling pump was used to sample the wells; the tubing used was a combination of Tygon 3/16 ID for the peristaltic pump head and Teflon 3/16 ID for inside the well. Tubing was replaced after each well to avoid cross contamination. The pump intake was placed approximately 1 foot below the water table. In wells that had a screen length that was entirely submerged, the pump intake was placed approximately 1 foot below the top of the screen. Values of pH, specific conductivity, temperature, dissolved oxygen and turbidity of the purged groundwater were measured by taking samples from the pump discharge. Electronic water quality measuring devices were utilized for this activity. The measurements are presented in Table 1. The presence of floating product, if any, was measured using an ORS Water/Oil interphase probe.

Since all water samples were collected with dedicated disposable equipment, no equipment blank was required. The samples were relinquished to FedEx for next day delivery at the end of the sampling day. Chain-of-Custody Forms were filled out during the sampling day. Copies of Chain-of-Custody Forms are included in **Appendix D**.

### 1.3 Decontamination

With the exception of the ORS and the water quality meters, all equipment was dedicated for each well. Therefore, minimal decontamination was required. Decontamination consisted of a rinse with D.I. water followed by a laboratory grade (micro) detergent and a final rinse with D.I. water. This was also done to the dedicated tubing before it was discarded. All decontamination and purged water was left onsite to be treated at the CPCPRC Wastewater Treatment Plant.



#### **1.4 Results**

The analytical results for all five monitoring wells were reported to be Non-Detect (ND). Copies of the analytical results are included in **Appendix C** of this report.

